

**CLAIMS**

1. A fuel cell comprising a sheet-like solid polymer electrolyte, a cathode-side electrode plate arranged on one side of the solid polymer electrolyte, an anode-side electrode plate arranged on the other side, a cathode-side metal plate which is arranged on a surface of the cathode-side electrode plate and enables a gas to be flown to an internal side, and an anode-side metal plate which is arranged on a surface of the anode-side electrode plate and enables a fuel to be flown to an internal side,

wherein a circumferential part of the solid polymer electrolyte is extended from the electrode plates on both sides, and circumferences of the metal plates on both sides are mechanically sealed in the state where they are electrically insulated, while the circumferential part is held by opposite parts of the metal plates.

2. The fuel cell according to claim 1, wherein the circumferences of the metal plates on both sides are mechanically sealed by bending press.

3. The fuel cell according to claim 1, wherein a flow path groove formed by press processing, and an inlet and an outlet communicating with the flow path groove are provided on the anode-side metal plate.

4. The fuel cell according to claim 1, wherein a flow path groove formed by etching, and an inlet and an outlet communicating with the flow path groove are provided on the anode-side metal plate.

5. The fuel cell according to claim 1, wherein a flow path groove is formed on an external surface of the cathode-side electrode

plate and/or the anode-side electrode plate and, an inlet and an outlet communicating with the flow path groove are provided on a metal plate arranged on a surface thereof.

5           6. The fuel cell according to claim 5, wherein the cathode-side electrode plate and/or the anode-side electrode plate is such that a catalyst is carried on at least one side of an aggregate of fibrous carbon, and a flow path groove in which the fibrous carbon has been removed by laser irradiation is formed on the other side.

10           7. The fuel cell according to claim 1, wherein the circumferential part of the solid polymer electrolyte is extended to be exposed from a circumference of a sealed metal plate.

15           8. The fuel cell according to claim 7, wherein an insulating material is further interposed between a circumference of the metal plate and a circumferential part of the solid polymer electrolyte.

20           9. The fuel cell according to claim 1, wherein a thickness of a circumferential part of at least one of the anode-side metal plate and the cathode-side metal plate is made smaller by etching than a thickness of other part.

25           10. The fuel cell according to claim 1, wherein an opening part for supplying oxygen in the air is provided on the cathode-side metal plate.

30           11. The fuel plate according to claim 1, wherein a circumferential part of the solid polymer electrolyte is held by metal plates on both sides via an annular sealing member.

12. The fuel cell according to claim 1, wherein the fuel cell has a structure in which an external circumferential part of one metal plate is greater than an external circumferential part of the other metal plate, and an external circumferential part of the one metal plate is turned up so as to holding-press an external circumferential part of the other metal plate and, a surface of the other metal plate and a surface of the turned up external circumferential part are used as a current taking out part.